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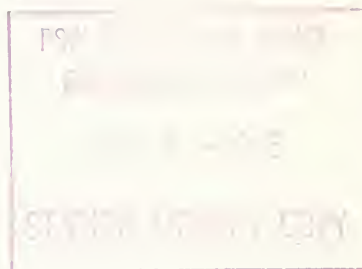
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GRADES FOR INLAND DOUGLAS-FIR SAW LOGS

IN STANDING TREES

by

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INTRODUCTION

An improved system for grading inland Douglas-fir saw logs in standing trees has been developed by the Station as part of the U.S. Forest Service log and tree grade research program. This research note presents the grading specifications and a summary statement of their interpretation and application. A more complete publication is being prepared to explain how these grades were developed and illustrate how they estimate lumber grade yield and segregate logs into value classes.

The Station is currently investigating tree grades for inland Douglas-fir--a system for evaluating the entire tree in contrast with grading fixed segments or logs in the stem. This research is nearing completion and may provide timber cruisers with choice of using tree grades or log grades for estimating the quality of standing inland Douglas-fir sawtimber. For this reason, the log grades described in this paper have been adopted for Forest Service use on an interim basis.

THE GRADING SPECIFICATIONS

Grade 1

Branches and

branch stubs: Any number, live or dead, less than 1 inch in diameter permitted.

Scars: None permitted.

Sweep and

crook: Cruise volume deduction must not exceed 10 percent of gross volume.

Grade 2

Branches and
branch stubs: Live: Any number 3 inches or less in diameter
permitted.

Dead: Any number 2 inches or less in diameter
permitted.

Scars: None permitted (see exception).

Sweep and
crook: Cruise volume deduction must not exceed 20 per-
cent of gross volume (see exception).

Exception: Any log meeting Grade 1 specifications for
branches and stubs may have any number of
scars and may also have sweep and crook in
excess of 20 percent.

Grade 3

Includes all logs not qualifying for Grades 1 and 2 that are
at least 6 inches in diameter, 8 feet long, and estimated to
have at least one-third of their gross cruise volume in sound
wood suitable for manufacturing standard lumber.

INTERPRETATION OF THE SPECIFICATIONS

Log Length

These grades are primarily for application to logs in nominal 16-foot lengths as cruised in standing trees. The actual cruised log lengths may vary slightly from 16 feet because of estimated stump height, trimming allowance, top diameter limit, and cruising methods for handling forked stems, broken tops, or other tree characteristics. Appropriate regional or local cruising instructions should be followed in establishing the nominal 16-foot grading lengths.

If segments other than 16 feet are graded, e.g., top logs, the grading specifications will be applied without any adjustment for length. The minimum length to be considered for grading is 8 feet.

Log Diameter

Log diameter is an inherent part of the grading system and is not considered in establishing the grade of a log. In application, it is handled by developing the log grade performance data by log diameter classes.

Minimum diameter considered for grading will be 6 inches, estimated top d.i.b.

Merchantability Standards

Only logs from live trees will be graded. Logs must have an estimated one-third or more of their gross cruise volume in sound wood that is judged to be suitable for manufacturing standard lumber, as defined by the Western Wood Products Association. Logs that are estimated to have less than one-third of their gross cruise volume in sound wood are considered Cull and will not be further graded.

Grading Characteristics

Grading is based solely on surface characteristics of the log that are visible as it stands in a tree. Each log is to be graded on its own characteristics, without considering the characteristics of other logs in the tree. Consider all of the log surface as cruised, including any trimming allowance. Three general types of visible characteristics determine the grade of a log: (1) branches or branch stubs, (2) scars, and (3) sweep or crook. Other log characteristics are disregarded in determining log grade.

Branches and Branch Stubs

The most important factor in determining grade is the size and type of branches and/or branch stubs. The grading specifications for branches and branch stubs include branches broken off at the log surface and holes from which limbs have broken out. Overgrown branches ("indicators") are not considered.

The two classes of branches and branch stubs considered are live and dead. A live branch (or live stub) is one to which the bark still adheres and is expected to result in an intergrown or tight, sound knot in lumber. A dead branch or branch stub is one that has been dead for several years and is without bark. It is expected to result in an encased or loose, unsound knot in lumber.

When branch clusters are present, the branch and branch stub specifications will be applied to the largest branch (or stub) in the cluster.

The diameter of a branch or branch stub is the estimated outside diameter adjacent to, but outside of, any branch collar present at the juncture of the branch and tree stem.

Scars

The degrading scars referred to in the specifications are timber defects commonly described as fire scars, cat faces, seams, frost cracks,

lightning scars, rotten holes, mechanical damage, and other such injuries. Such scars in inland Douglas-fir are most common in the butt log but may extend into, or originate in, the upper portion of the bole. All scars are considered degrading if they are overgrown. Partially overgrown scars will also be considered degrading if the underlying wood is judged to be decayed, excessively pitchy, or severely checked to the extent that lumber recovery is affected. Fresh scars or injuries that are judged to be superficial with respect to lumber recovery will be disregarded. The grader must decide if scars of recent origin are superficial--if old and partially overgrown, they are almost always degrading.

Sweep and Crook

Any sweep or crook that results in a cruising volume deduction in amounts described in the specifications will be considered.

APPLICATION OF THE GRADES

In applying these grades to logs in standing trees, the suggested procedure is to first determine the branch size and type (live or dead) category. For most inland Douglas-fir trees, it can easily be determined if any visible limbs or stubs are less than 1 inch (potentially Grade 1) or, if they are larger, whether the dead limbs exceed 2 inches and the live ones exceed 3 inches. If there are no degrading scars, sweep, or crook, the grade is thus established; if these defects are present, the grade can be quickly determined by applying the appropriate specifications.

As explained previously, log diameter is an integral part of the grading system, and all performance data should be collected and applied on a diameter class basis.

SUMMARY OF THE
SAW LOG GRADES FOR INLAND DOUGLAS-FIR

The following is a pocket-size summary of the grading specifications for quick field reference.

SUMMARY OF INLAND DOUGLAS-FIR SAW LOG GRADES^{1/}

| Grade | Grading Specifications |
|-------|--|
| 1 | Any number of live or dead branches or stubs, <u>less</u> than 1 inch. No scars permitted. Volume deduction for sweep or crook not exceeding 10 percent. |
| 2 | Any number of <u>live</u> branches or stubs, 3 inches or less. Any number of <u>dead</u> branches or stubs, 2 inches or less. No scars permitted (see exception) ^{2/} Volume deduction for sweep or crook not exceeding 20 percent (see exception) ^{2/} |
| 3 | Any log not qualifying for Grade 1 or Grade 2 that is at least 8 feet long, 6 inches d.i.b., and one-third sound. |

^{1/} Prepared by the Douglas-fir Log and Tree Grade Research Project, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

^{2/} Any log meeting Grade 1 specifications for branches and stubs may have any number of scars and also sweep and crook in excess of 20 percent.

INTERPRETATION OF THE SPECIFICATIONS

| | |
|------------------------------|--|
| <u>Log length</u> | Grades primarily for 16-foot logs as cruised--apply to other lengths without adjustment. Logs graded must be at least 8 feet long. |
| <u>Log diameter</u> | Do not consider in grading (except logs must be at least 6 inches top d.i.b.). |
| <u>Merchantability</u> | Grade only logs in live trees that are at least one-third sound. |
| <u>Grade characteristics</u> | Consider only branches or branch stubs, scars, or sweep and crook. |
| <u>Branches</u> | Estimate diameter outside bark and collar. In clusters consider largest branch or stub. Disregard "indicators." |
| <u>Scars</u> | Consider as degrading all overgrown fire scars, cat faces, seams, frost cracks, lightning scars, rotten holes, mechanical damage, etc. Consider partially overgrown scars degrading if judged to affect lumber recovery. Disregard fresh scars or injuries judged to be superficial. |
| <u>Sweep or crook</u> | Consider when cruising volume deduction is in amounts described in the specifications. |

